REMARKS

Claims 1 – 20 are pending with claims 17-18 withdrawn and claims 19-20 added. Claim 9 has been amended to correct grammatical errors. Applicants respectfully submit that the amendments are not related to the patentability or scope of the claims.

I. The Rejections Under 35 U.S.C. §103

(i) claims 1-8

Claims 1-8 were rejected under 35 U.S.C. §103(a) based on the combination of U.S. Pat. No. 4,344,477 to Miki et al ("Miki") in view of U.S. Pat. No. 5,040,589 to Bradley et al ("Bradley"). Applicants respectfully disagree and traverse these rejections for at least the following reasons.

Neither Miki nor Bradley discloses the feature of "a substantially continuous void free interface between a core object and a metal slurry" as in claim 1 (as well as in claim 9, i.e., the cooling step). In fact, both Miki and Bradley appear to be silent with respect to such a feature.

What is more, there is insufficient motivation to combine Miki and Bradley. Instead, one of ordinary skill would recognize that a thixotropic metal has a higher viscosity than molten metal (see, e.g., the paragraph bridging columns 13-14 of Bradley). Because of this higher viscosity one of ordinary skill would not expect to be able to create a substantially continuous void free

interface. Miki provides insufficient motivation to use a thixotropic metal because the higher viscosity metal would have less flowability in forming intimate contact to create the interface with the object. As such, there is no predictable solution or common sense result of forming a substantially continuous void free interface by combining the teachings of these references. See, e.g., *KSR International Co. v. Teleflex, Inc.*, 82 USPQ2d 1385 (2007).

(ii) claim 2

Claim 2 (as dependent on claim 1) provides significant and unexpected results by producing a substantially continuous void free interface by injecting a thixotropic metal into a mold cavity containing at least a part of a thermally conductive core object. This result is significant and unexpected due to the high viscosity of the thixotropic metal as discussed above. Thus, this further establishes the patentability of this claim.

(iii) claim 4

In the Office Action the Examiner acknowledges that Miki does not disclose the use of a magnesium alloy. To make up for this deficiency the Examiner relies upon Bradley.

The Applicants agree that Miki does not disclose a magnesium alloy. More specifically, Miki fails to teach or suggest a metal slurry including an

AZ91D magnesium alloy as in claim 4. Instead, Miki discloses the use of an aluminum alloy.

Turning to Bradley, though it appears to disclose the use of a magnesium alloy, there is no discussion within Bradley of an AZ91D magnesium alloy nor any discussion, either implicitly or explicitly, which would suggest to one skilled in the art that an AZ91D magnesium alloy can be used to implement the principle of operation of Bradley out of the countless alloys that could be chosen to do so.

In more detail, Bradley is aimed at the processing effects of metal alloys during their conversion to a thixotropic state. It does not specify an AZ91D magnesium alloy.

Accordingly, the Applicants respectfully request withdrawal of the rejections and allowance of claims 1-8.

(iii) claims 9-16

Claims 9-16 were rejected under 35 U.S.C. §103(a) based on the combination of Miki, Bradley, and U.S. Pat. No. 3,841,390 to DiBenedetto et al ("DiBenedetto"). Applicants respectfully disagree and traverse these rejections for at least the following reasons.

As indicated above, neither Miki nor Bradley discloses the feature of "a substantially continuous void free interface between a core object and a metal

slurry" as in the cooling step of claim 9. In addition, there is insufficient motivation to combine Miki and Bradley as discussed above. Further, DiBenedetto does not make up for these deficiencies.

Accordingly, the subject matter of claims 9-16 is not rendered obvious in view of Miki, Bradley nor DiBenedetto.

In addition, the Applicants note that the combination of DiBenedetto, Miki and Bradley is impermissible because such a combination would render one or more of these references unsatisfactory for its intended purpose.

For example, vulcanized rubber belts discussed in DiBenedetto are not suitable to be used at the pressures and temperatures disclosed in Miki and Bradley without losing their structural integrity.

More specifically, DiBenedetto discloses a casting machine 10 that includes closed loop belts 32 and 33 made from vulcanized rubber to form a series of casting pieces attached to a runner casting 114 (see columns 2-4 and FIGS. 4-5).

Miki discloses a die casting machine operating at 650° C. at 200 – 1000 kg/cm^2 (see, e.g., column 6) while Bradley discloses operating temperatures greater than 600° C. at a pressure of 1850 psi (see, e.g., columns 6 and 8). One skilled in the art would recognize that, in all likelihood, DiBenedetto's vulcanized rubber belts are not suitable for use at the pressures and

temperatures disclosed in Miki and Bradley. Thus, the combination of references proposed by the Examiner would render DiBenedetto unsatisfactory for its intended purpose.

Accordingly, the Applicants respectfully request withdrawal of the rejections and allowance of claims 9-16.

II. Information Disclosure Statement (IDS)

Applicants respectfully request that the Examiner consider and return an initialed copy of the second page of the PTO-1449 originally submitted March 20, 2002.

Conclusion:

For all of the above stated reasons, reconsideration and withdrawal of the outstanding rejections and favorable allowance of all claims in the instant application are earnestly solicited.

In the event that there are any outstanding matters remaining in the present application, the Examiner is invited to contact John E. Curtin at 703-266-3330 to discuss this application.

If necessary, the Commissioner is hereby authorized in this, concurrent, and future replies to charge payment or credit any overpayment to Deposit Account No. 50-3777 for any additional fees required under 37 C.F.R. §§ 1.16 or 1.17; particularly, extension of time fees.

Very truly yours,

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